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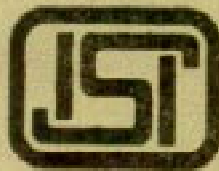
“Knowledge is such a treasure which cannot be stolen”

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Indian Standard
SPECIFICATION FOR
SHEAVES USED WITH SHIP'S BLOCKS

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 1

Indian Standard

SPECIFICATION FOR SHEAVES USED WITH SHIP'S BLOCKS

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Indian Standard

SPECIFICATION FOR SHEAVES USED WITH SHIP'S BLOCKS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 25 May 1971, after the draft finalized by the Shipbuilding Sectional Committee had been approved by the Marine, Cargo Movement and Packaging Division Council.

0.2 Ship's blocks for wire rope are used in various positions with the cargo handling gear and other general purpose work on ships. The blocks used on ships have to be tested to proof loads as specified in the Indian Dock Labourers Regulations, 1948, which is in accordance with the ILO convention.

0.2.1 This standard generally covers the regulations for the construction and testing of cargo handling appliances specified by the Classification Societies.

0.2.2 Ship's blocks using wire ropes are permitted to be used only as deck lead blocks, or as span blocks single or double reeved for topping the unloaded derrick. In addition, they can also be used as lead blocks, for guy tackle runners, if the runners are turned round to an angle of not more than 90°.

0.3 In the preparation of this standard, considerable assistance has been derived from the following, issued by Deutscher Normenausschuss (Germany) :

DIN 82235 Sheaves for wire ropes, groove bottom diameter $9 \times$ diameter of rope

DIN 82236 Sheaves for wire ropes, groove bottom diameter $\approx 14 \times$ diameter of rope.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard specifies the material and dimensions of sheaves used with ships' blocks of nominal sizes 1 to 12.

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definition shall apply.

2.1 Nominal Size — Safe working load in tonnes of the block with which the sheave is used, is the nominal size of the sheave.

3. GENERAL

3.1 Sheaves are classified as Types A, B1, B2 and B3. The diameter of the sheave measured at the bottom of the groove shall at least be nine times for Type A and 14 times for Type B of the diameter of the appropriate rope.

3.2 The radius of the groove shall be about 1 mm more than the radius of the rope used, to ensure that the rope lies properly at the bottom of the groove. If the groove is too wide, the rope would, owing to the pull, become flattened and its wear will be considerably increased. The angle formed by the sides of the grooves varies from 30 to 45°. The depth of the groove is approximately equal to the diameter of the rope used. The nominal strength of rope used shall be taken as 130 kg/mm² even if ropes of greater nominal strength are used.

3.3 The bushes for Types A and B1 are similar. The bushes are a force fit in the boss of the sheave. For Types A and B1 (see figure in Table 3) number of holes are drilled in the bush for lubrication. For Types B2 and B3, three equally spaced grooves are provided in the bush for receiving the leather pieces. The oil passages are located differently, in Types B2 and B3 as shown in figure in Table 3.

4. MATERIAL

4.1 The material used for the manufacture of sheave and bush shall be as given below:

<i>Sl No.</i>	<i>Name of Part</i>	<i>Material Conforming to</i>
i)	Sheave	IS : 210-1962*, Grade 25 IS : 1865-1968†, Grade SG 38

*Specification for grey iron castings (*revised*).

†Specification for iron castings with spheroidal or nodular graphite (*first revision*).

<i>Sl No.</i>	<i>Name of Part</i>	<i>Material Conforming to</i>
		IS : 2107-1962*
		IS : 2108-1962†
		IS : 1570-1961‡, C20
		IS : 1030-1962§
ii)	Bush	IS : 318-1962 , Grade 2

5. DIMENSIONS

5.1 The dimensions for Types A and B shall be as shown in Tables 1 and 2 respectively.

5.2 The dimensions for the bush shall be as shown in Table 3.

6. TOLERANCES

6.1 The tolerance for certain dimensions are shown in Tables 1, 2 and 3. The tolerance on other dimensions shall be coarse deviation according to IS : 2102-1969¶.

6.2 There shall be no negative tolerance on dimension t_1 , in Tables 1 and 2.

*Specification for whiteheart malleable iron castings.

†Specification for blackheart malleable iron castings.

‡Schedules for wrought steels for general engineering purposes.

§Specification for steel castings for general engineering purposes (*revised*).

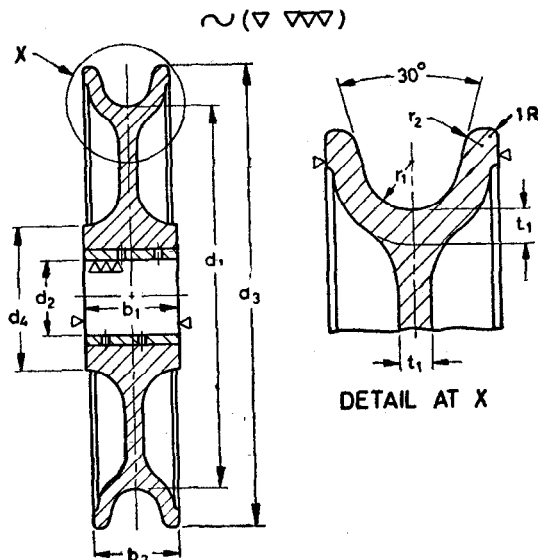
||Specification for leaded tin bronze ingots and casting (*revised*).

¶Allowable deviations for dimensions without specified tolerances (*first revision*).

TABLE 1 DIMENSIONS FOR TYPE A SHEAVES

(Clauses 5.1, 6.1 and 6.2)

All dimensions in millimetres.



NOMINAL SIZE OF SHEAVE	*WIRE ROPE DIA	b_1 h13	b_2 h13	d_1	d_2 C11	d_3	d_4	r_1 ± 0.5	r_2 Approx	t_1	
										Cast Iron	Other† Material
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1	12	27	25	112	22	135	42	7	2.5	7	5
2	16	34	32	150	32	180	56	9	2.5	8	6
3	20	42	40	180	40	220	70	11	4.0	9	6
4	22	48	46	215	45	260	80	12	5.0	9	7
5	24	54	52	235	50	290	85	13	6.0	10	7
6	28	60	58	270	55	330	96	15	6.0	11	8
8	32	67	64	300	65	365	105	17	6.0	12	9
10	36	75	72	325	70	400	120	19	8.0	14	10
12	40	83	80	360	80	440	125	21	8.0	16	12

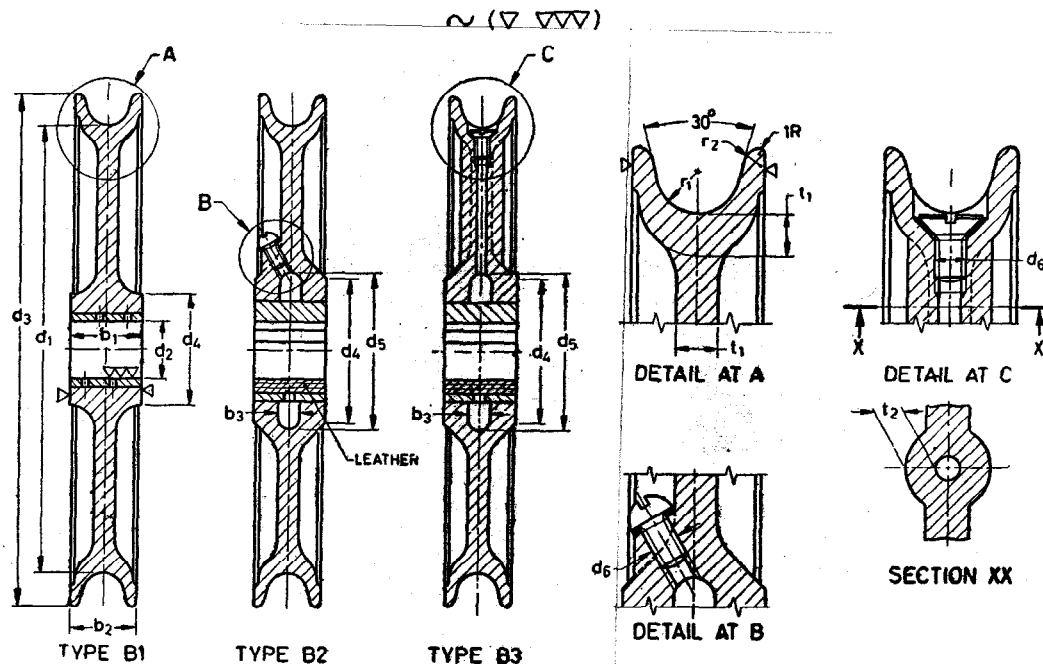
*Fibre core wire rope, 6 × 19 construction, according to IS : 2581-1968 Round strand galvanized steel wire ropes for shipping purposes (first revision).

†Other materials are steel, nodular or malleable cast iron or cast steel.

TABLE 2 DIMENSIONS FOR TYPES B1, B2 and B3 SHEAVES

(Clauses 5.1, 6.1 and 6.2)

All dimensions in millimetres.



NOMINAL SIZE OF SHEAVE	*WIRE ROPE DIA	b_1 h13	b_2 h13	b_3	d_1	d_2 C11	d_3	d_4			d_5	d_6	r_1 ± 0.5	r_2 Approx	t_1		t_2 Approx
								Type B1	Types B2 and B3						Cast Iron	Other† Material	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	
1	12	27	25	8	170	22	195	42	55	60	M6	8	3	8	5	6	
2	16	34	32	10	225	32	260	55	70	75	M6	10	3	9	6	7	
3	18	42	40	14	255	40	295	70	85	90	M8	11	4	10	7	8	
4	20	48	46	15	280	45	320	80	95	100	M8	12	4	11	8	8	
5	22	54	52	16	315	50	360	85	100	115	M8	13	4	12	9	9	
6	26	60	58	18	375	55	430	95	110	125	M8	15	5	13	10	9	
8	28	67	64	20	400	65	460	105	120	135	M10	16	6	14	11	10	
10	32	75	72	22	450	70	515	115	130	145	M12	18	8	14	11	10	
12	36	83	80	22	505	80	580	125	140	155	M12	20	8	16	12	11	

*Fibre core wire ropes, 6 × 37 Construction, according to IS : 2581-1968 Round strand galvanized steel wire ropes for shipping purposes (first revision).

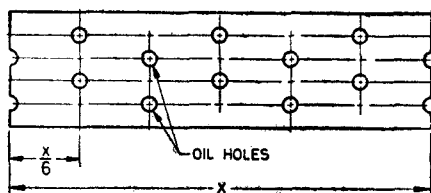
†Other materials are steel, nodular or malleable cast iron or cast steel.

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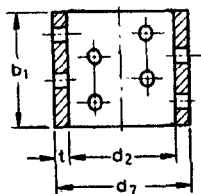
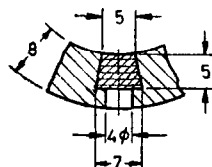
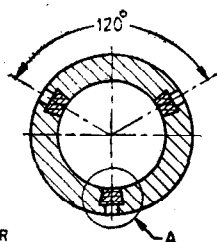
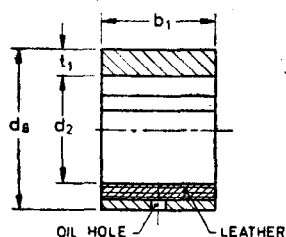
TABLE 3 DIMENSIONS FOR BUSHES FOR SHEAVES

(Clauses 3.3, 5.2 and 6.1)

All dimensions in millimetres.



DEVELOPED VIEW OF BUSH

**BUSH FOR TYPE A AND TYPE B1 SHEAVES**

DETAIL AT A

BUSH FOR TYPE B2 AND B3 SHEAVES

d_2 H7	d_7 r6	d_8 r6	t	t_1
(1)	(2)	(3)	(4)	(5)
22	28	38	3	8
32	40	48	4	8
40	50	56	5	8
45	55	61	5	8
50	60	66	5	8
55	67	71	6	8
65	80	81	7.5	8
70	85	86	7.5	8
80	100	100	10	10

NOTE — See Table 2 for dimension b_1 .

INDIAN STANDARDS

ON

Ship's Rigging and Mooring Equipment

IS:

3381-1965	Cast vertical bollards with and without lugs
4478-1968	Glossary of terms for ship's derricks
4484-1967	Electrically-welded stud link anchor chains and attachments
4690-1968	Mooring buoy shackles
4692-1968	Electrically-welded studless link anchor chains and attachments
5220-1969	Forged horn cleats
5221-1969	Gooseneck pin and bearings for heavy-lift derricks
5240-1969	Cast skew bollards
5625-1970	Cast cruciform bollards
5628-1970	Cast deck-end rollers
5859-1970	Tools for handling of anchor chains and attachments
5976-1971	Ship's punkah-louvres
6140-1971	Ship's snatch blocks
6141-1971	Ship's single sheave blocks without becket
6142-1971	Ship's single sheave blocks with becket
6144-1971	Axle pins used with ship's blocks
6145-1971	Locking plate for axle pin used with ship's blocks
6146-1971	Beckets used with ship's blocks
6147-1971	Supporting straps used with ship's blocks
6148-1971	Head fittings and round nuts used with ship's blocks